

Hurst, P.; Kavussanu, M.; Davies, R.; Dallaway, N.; Ring, C. Use of Sport Supplements and Doping Substances by Athletes: Prevalence and Relationships. *J. Clin. Med.* 2024, 13, 7132. <https://doi.org/10.3390/jcm13237132>

### **“The more the better?” ... How increased use of supplements could lead to doping**

Most competitive athletes use dietary supplements, such as energy drinks, protein shakes and caffeine, to help improve their performance and enhance their chance of sporting success. However, in the past decade, researchers have shown that athletes who regularly use dietary supplements may be more likely to use doping substances, such as anabolic steroids, human growth hormone and erythropoietin (EPO). Many scientific studies have reported that dietary supplement users often report a greater willingness to use doping substances than non-users. In fact, a recent meta-analysis, which summarises all the available research papers, showed that dietary supplement users were nearly three times more likely to dope than non-users (Hurst et al., 2023).

A reason why supplement users may be more likely to dope than non-users could be athletes' need to seek out more potent and effective supplements. That is, an athlete using caffeine to help improve their performance may begin to think that they will achieve more improvements if they also use  $\beta$ -alanine and sodium bicarbonate. Over time, the athlete may seek out stronger and more effective substances and this thinking may encourage them to turn to doping substances. This account is called the “Gateway Hypothesis”. This hypothesis has been used to help explain why an athlete using more supplements may be more likely to dope in the future.

It is worth noting, however, that despite being at an increased risk of doping compared to non-users, most supplement users will never dope. There are underlying reasons why a

supplement user might progress to doping. An athlete's belief about how effective dietary supplements are for improving their performance has been shown to be a key factor in how likely that athlete is to dope. Athletes who use supplements and believe they are effective performance enhancers, are more likely to dope, whereas those who use supplements but do not believe they are effective, are less likely to dope. In short, the positive relationship between supplement use and doping use can operate through an athlete's beliefs about supplement effectiveness.

In our recent study (Hurst et al., 2024), we wanted to discover whether the number of supplements an athlete uses is related to beliefs about their effectiveness, and in turn, if this can help explain reasons for doping. We asked over 300 competitive athletes to complete an anonymous, online questionnaire about 1) the dietary supplements they use, 2) how much they believe supplements are effective for improving performance, 3) if they would dope in a hypothetical situation, and 4) if they had doped.

We found that most athletes used supplements, with sport drinks (e.g., energy drinks) being the most popular, followed by caffeine and sport bars (e.g., protein bars). Only a small number (4%) of our participants admitted to doping. Importantly, we found that the more supplements an athlete used, the greater belief they had in a supplement's effectiveness for improving performance, and in turn, this belief predicted their likelihood to dope in a hypothetical situation and to actually dope. In other words, the more supplements an athlete uses, their belief about how effective they are is greater, which can make them more likely to use doping substances.

The results of this study highlight the risks of using dietary supplements over time. Athletes who seek out more supplements to improve their performance may develop the belief that they are necessary and effective for their performance, and this over time, may increase the chances of them using a doping substance. Coaches, nutritionists, and parents alike, should educate athletes about the need to use supplements and question whether they benefit their performance over and above other means (e.g., tailored training programme, balanced diet, optimal sleep). Finally, as supplement users are at an increased risk of doping, national and international sport organisations, including NADOs, should aim to target athletes who frequently use dietary supplements in their intervention programmes to discourage the need to use performance enhancing substances.

## References

- Hurst, P., Kavussanu, M., Davies, R., Dallaway, N., & Ring, C. (2024). Use of sport supplements and doping substances by athletes: Prevalence and relationships. *Journal of Clinical Medicine*, *13*(23), 7132.
- Hurst, P., Schiphof-Godart, L., Kavussanu, M., Barkoukis, V., Petróczi, A., & Ring, C. (2023). Are dietary supplement users more likely to dope than non-users?: A systematic review and meta-analysis. *International Journal of Drug Policy*, *117*, 104077.